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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

BODDIE, WILLIAM

ART UNIT

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2629

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/691,312	Applicant(s) LEE ET AL.	
	Examiner WILLIAM L. BODDIE	Art Unit 2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 November 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 31-40 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 31-40 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. In an amendment dated, November 19th, 2010 the Applicants cancelled claims 19, 24-30 and added new claims 31-40. Currently claims 31-40 are pending.

Response to Arguments

2. Applicant's arguments with respect to claims 31-40 have been considered but are moot in view of the new ground(s) of rejection.

Claim Objections

3. Claim 32 is objected to because of the following informalities: line 2 reads in part, "reduced is same as the gray scale." This is incorrect grammatically. Appropriate correction is required.
4. Claim 36 is objected to because of the following informalities: line 5 reads in part, "increasing gray scale vales of B data." This is incorrect grammatically. Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
6. Where applicant acts as his or her own lexicographer to specifically define a term of a claim contrary to its ordinary meaning, the written description must clearly redefine the claim term and set forth the uncommon definition so as to put one reasonably skilled in the art on notice that the applicant intended to so redefine that claim term. *Process Control Corp. v. HydReclaim Corp.*, 190 F.3d 1350, 1357, 52 USPQ2d 1029, 1033 (Fed. Cir. 1999). The term "bit" in claims 31-40 is used by the claim to mean "gray scale

level”, while the accepted meaning is “the smallest form of information, a 0 or a 1.” The term is indefinite because the specification does not clearly redefine the term.

7. This distinction was discussed in the very first office action submitted on this application over 4 years ago. In all subsequent amendments the proper terminology has been used until the most recent amendment.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 31-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yui (US 5,677,741) in view of Kimura et al. (US 6,008,786).

With respect to claim 31, Yui discloses, a display device (6 in fig. 1), comprising:

a display panel (6 in fig. 4),

a lookup table (9 in fig. 4) for storing a gray scale values data (output data in figs. 6a2-c2; col. 3, lines 58-65) of image information including R, G and B data (RGB input data in fig. 4), and storing a gray scale value of a bit of the B data (fig. 6C1-2) prior to a bit at which a color reproducibility is reduced (col. 4, lines 26-33; also note 21 in fig. 4; the display color space in figs. 5a-c; controller 7 determines the level at which color reproducibility is reduced col. 4, lines 26-37, 57-67), as a gray scale value of bits from the bit at which a color reproducibility is reduced to an uppermost bit (clear from figs.

6a-c that the stored gray scale value (output data) is the maximum gray scale value accurately displayable by the display panel);

a data processing unit for compensating image information according to the gray scale value of the lookup table (3, 5 and 7 in fig. 4, for example); and

a data driving unit (5 in fig. 4) for receiving the compensated image information and applying the compensated image information to the display (col. 2, lines 45-48).

Yui does not expressly disclose, that the display panel is a LCD panel with the requisite control circuitry.

Kimura discloses, a liquid crystal display (LCD) panel (1 in fig. 1), comprising:

a liquid crystal panel having a plurality of gate lines and data lines (Y and X lines, respectively in fig. 1) crossing each other and having red, green and blue pixels (col. 1, lines 46-47) arranged in a matrix pattern (col. 1, lines 21-26);

a gate driving unit for applying scan signals to the gate lines (5 in fig. 1; col. 1, lines 33-36); and

a data driving unit for receiving compensated image information and applying the compensated image information to the data lines (3 in fig. 1; col. 1, lines 31-33).

Kimura and Yui are analogous art because they are both from the same field of endeavor namely gray scale optimization within display panels.

At the time of the invention it would have been obvious to one of ordinary skill in the art to replace the display panel of Yui with the LCD panel taught by Kimura.

The motivation for doing so would have been, low power consumption, decreased cost and fast response (Kimura; col. 1, lines 16-20).

With respect to claim 32, Yui and Kimura disclose, the device of claim 31 (see above).

Yui further discloses, wherein the gray scale value of the bit of the B data prior to a bit at which a color reproducibility is reduced is same as the gray scale value of the bits from the bit at which a color reproducibility is reduced to the uppermost bit (note the figures in fig. 6a-c; which clearly show the gray scale value at all points after color reproducibility is reduced is the same as the immediately previous value).

With respect to claims 33-35, Yui and Kimura disclose, the LCD device of claim 31 (see above).

Yui does not expressly disclose a set of 64 gray scale levels.

Kimura discloses the use of 64 gray scale levels (col. 4, lines 38-44; and col. 1, lines 52-56).

At the time of the invention it would have been obvious to one of ordinary skill in the art to replace the 255 levels of Yui with the 64 of Kimura for the well-known benefits of reduced memory requirements and processing speed thereby resulting in reduced cost.

It is clear from figures 6A-2-6C-2 of Yui that once the input gray scale levels reach a certain level (based on the reproducibility of the device), that level is maintained until the maximum gray scale level.

With the conversion of Yui to a 64 level gray scale the clipped portion in figure 6 would likely begin close to a 52nd gray scale level. More importantly, if the color

reproducibility of the display required that the gray scale be clipped at the 52nd level then the disclosure of Yui could clearly accommodate that.

Furthermore, lacking a definite advantage of freezing grayscale values at the 52nd level in the current invention, there does not appear to be any reason for specifically selecting the 52nd level versus the 51st or 50th levels. This selection appears to be entirely predicated on at what level the color reproducibility begins to decrease. As Yui discloses adjusting the clipping of the gray scale based on the color reproducibility of the device, Yui is seen as sufficiently anticipating this limitation of claim 25.

10. Claims 36-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yui (US 5,677,741) in view of Kimura et al. (US 6,008,786) and further in view of McKinnon et al. (US 6,227,668).

With respect to claim 36, Yui discloses, a method for improving a color reproducibility of a display device (6 in fig. 1), the method comprising:

detecting a gray scale level of a bit at which color reproducibility is reduced, and a gray scale value of a bit prior to the bit at which a color reproducibility is reduced (note 21 in fig. 4; the display color space in figs. 5a-c; controller 7 determines the level at which color reproducibility is reduced col. 4, lines 26-37, 57-67);

storing the gray scale value of the bit prior to the bit at which a color reproducibility is reduced, as a gray scale value of bits from the bit at which color reproducibility is reduced to an uppermost bit (clear from figs. 6a-c that the stored gray

scale value (output data) is the maximum gray scale value accurately displayable by the display panel; col. 4, line 57 – col. 5, line 11);

compensating the image information according to the gray scale value (clear from figs. 6a-c2 that the B color level has been analyzed and compensated); and

applying the compensated image information to the display panel (6 in fig. 1).

Yui does not expressly disclose the method of determining the point of color reproducibility reduction nor the use of a LCD.

D'Souza discloses a LCD display (col. 4, lines 60-63) driving method compensating image information (input R,G,B in fig. 2) and that retrieval of a R and G color value (506 values in fig. 5; specifically note the clipped B values and corresponding R and G values).

D'Souza and Yui are analogous because they are from the same field of endeavor namely, gray scale optimization within display panels.

At the time of the invention it would have been obvious to one of ordinary skill in the art to use the image processing of Yui in an LCD taught by D'Souza.

The motivation for doing so would have been, to more accurately display colors, in a more cost effective way than using sRGB monitors (D'Souza; col. 2, lines 4-15).

Neither D'Souza nor Yui expressly disclose how the detection is carried out.

McKinnon discloses, measuring color reproducibility of a display by measuring a color displayed on the display panel with increasing gray scale values of the B color is increased (col. 3, lines 20-27; specifically note step (ii)).

McKinnon, D'Souza and Yui are analogous because they are from the same field of endeavor namely, gray scale optimization within display panels.

At the time of the invention it would have been obvious to one of ordinary skill in the art to perform the detecting step in the display of D'Souza and Yui as taught by McKinnon.

The motivation for doing so would have been to precisely determine the threshold level (McKinnon; col. 3, lines 26-27).

With respect to claims 38-40, Yui, McKinnon and Kimura disclose, the LCD device of claim 31 (see above).

Yui does not expressly disclose a set of 64 gray scale levels.

Kimura discloses the use of 64 gray scale levels (col. 4, lines 38-44; and col. 1, lines 52-56).

At the time of the invention it would have been obvious to one of ordinary skill in the art to replace the 255 levels of Yui with the 64 of Kimura for the well-known benefits of reduced memory requirements and processing speed thereby resulting in reduced cost.

It is clear from figures 6A-2-6C-2 of Yui that once the input gray scale levels reach a certain level (based on the reproducibility of the device), that level is maintained until the maximum gray scale level.

With the conversion of Yui to a 64 level gray scale the clipped portion in figure 6 would likely begin close to a 52nd gray scale level. More importantly, if the color

reproducibility of the display required that the gray scale be clipped at the 52nd level then the disclosure of Yui could clearly accommodate that.

Furthermore, lacking a definite advantage of freezing grayscale values at the 52nd level in the current invention, there does not appear to be any reason for specifically selecting the 52nd level versus the 51st or 50th levels. This selection appears to be entirely predicated on at what level the color reproducibility begins to decrease. As Yui discloses adjusting the clipping of the gray scale based on the color reproducibility of the device, Yui is seen as sufficiently anticipating this limitation of claim 25.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Art Unit: 2629

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to WILLIAM L. BODDIE whose telephone number is (571)272-0666. The examiner can normally be reached on Monday through Friday, 7:30 - 4:30 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sumati Lefkowitz can be reached on (571) 272-3638. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/William L Boddie/
Examiner, Art Unit 2629
12/6/2010